

# Long live OPTA!

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# Long Live OPTA!

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## Abstract

Although explicitly installed as a transitory body, the Dutch telecommunication controller OPTA displays the typical signs of government institutions that seek to become indispensable. A conflict in OPTA's two main policy objectives—guarding consumer prices through controlling the network operator and encouraging entry into the telecommunication market—hinders OPTA in making itself redundant. It is shown that a market structure with a dominant owner of the network and a few fringe firms, among which OPTA referees for ever, is a stable Nash equilibrium. Some possible remedies for this undesirable state of affairs are discussed. Long live OPTA, but leaner and meaner, supervising a symmetrically competing market.

*Keywords:* natural monopoly, network regulator, Niskanen effect.

*JEL-codes:* H11, L51.

## 1 Introduction

In order to check and balance the gradual process of liberalization in the Dutch telecommunication market, in August 1997 the government of the Netherlands installed the *Onafhankelijke Post en Telecom Autoriteit* (OPTA). As the liberalization was expected to over time invite sufficiently many new competitors into the telecom market to challenge the dominant former state monopolist KPN Telecom, it has always been the intention to do without OPTA again, once a reasonably equal and stable division of the market among several competitors would establish—in fact, only upon a long debate in parliament it was decided to install OPTA at all, as controlling the telecommunication market was thought by many to resort under the regular tasks of the *Nederlandse Mededingingsautoriteit* (NMa). In the 1996 notice to the Dutch parliament,

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accompanying the proposal to change the Telecommunicatiewet of 1988 to accommodate for installing OPTA, for example, it reads that:

“The postal and telecommunications sectors currently are in a transition phase from monopoly to perfect competition (*‘volledige mededinging’*). In light of the aim to establish perfect competition in both sectors as soon as possible, it has been decided to temporarily, and in addition to the existing general competition regulations, apply specific legal conditions that in certain cases inspect competitive relationships (among other things with an eye to ‘competition engineering’). (...) This specific regime will be terminated the moment one can speak of a functioning of the market that is such that it suffices to further do with the normal competition regime [NMa]. It is difficult to provide an indication as to when this will be possible. For that reason, an evaluation mechanism has been built into the law proposal.” (*Memorie van Toelichting bij de Wet Onafhankelijke Post- en Telecommunicatie Autoriteit*, pp. 9–10, our translation from the Dutch original.)<sup>1</sup>

In the process towards this envisioned competitive telecom market, OPTA’s main tasks would be the execution of those sections of the modified *Telecommunicatiewet* that concern market supervision. Besides mitigating in conflicts between individual suppliers, this task chiefly consists of controlling the tariffs that KPN Telecom charges others for the use of the fixed telecommunications network, the ownership of which it inherited from the Dutch government.

Since KPN Telecom is in a position of natural monopoly, this supervision of its tariffs is desirable. It would, after all, be both unreasonable and inefficient to allow the company to profit from an infrastructure and a dominant position in the market it has essentially obtained for free. It was therefore put in law that OPTA regularly checks tariff-proposals against KPN Telecom’s cost structure, and is required to accord them before they can be installed. More explicitly, the prices KPN Telecom’s charges to other telecommunication firms should be sufficiently close to KPN Telecom’s average costs. With this referee provision, KPN Telecom is kept from the temptation to exploit its exceptional position as owner of the fixed network, either to restrict entry into the telecom services market, or to make excessive economic profits on the services it supplies itself.

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<sup>1</sup>The provision was indeed part of the subsequent evaluation of OPTA. Cf. Kabinetsstandpunt evaluatie OPTA–6th July 2001.

Interestingly enough, the *Telecommunicatiewet* also specifies that OPTA is to be financed independently from government. To that end, OPTA is entitled to a fee from the telecom firms it supervises. That is, any supplier of telecommunication services that intends to use the KPN Telecom network, is required to pay a yearly contribution to OPTA, which consists of a fixed part and a part that varies in the number of connections the supplier services. Since the intention is that OPTA focuses its control on the dominant firm(s), rather than the fringe, it uses two tariff structures. Firms with a market share below 25% pay both a low fixed and a low variable tariff, whereas companies with so-called “considerable market power” (*aanmerkelijke marktmacht*), measured as a market share of more than 25%, pay a considerably higher amount.<sup>2</sup>

OPTA’s tariffs are in turn subject to a yearly revision by the *Minister van Verkeer en Waterstaat*, based on the costs OPTA reports to have been necessary for carrying out its task in the previous year.<sup>3</sup> These do not include costs made for bilateral mitigation, as the actual costs thereof are levied directly on the parties involved. The differentiation in OPTA’s tariffs between parties with and without considerable market power are acknowledged by the *Besluit vergoedingen Telecommunicatiewet* and equal 80% and 20% respectively.<sup>4,5</sup>

As said, the objective was and is to substantially trim OPTA’s operational powers, once it has accomplished its tasks of guidance to the liberalization process to the point that balanced competition in telecommunication services has been established. That is, upon a process of entry and exit in the market, OPTA’s duties would be reduced to just that of controlling the network fee and mitigating in isolated cases, a much more modest task than its present functions. It has, however, been observed that OPTA’s intentions have gradually changed. Instead of allowing to gradually be dissolved, it seems OPTA actively seeks for enlargement of its interventionist’s role.<sup>6</sup>

In itself, this kind of behaviour is not uncommon for a bureaucratic body—albeit it unbecoming. The seminal analysis of Niskanen (1971) on bureaucratic empire building presses the point that bureaucracies have the objective to maximize their budget—measured, for example, in terms of employees, or total costs,

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<sup>2</sup>For more details on the finance structure chosen for OPTA see *Besluit vergoedingen Telecommunicatiewet* (1999) and for the actual figures, see, for example, *Regeling vergoedingen OPTA 1999 and 2002*.

<sup>3</sup>As of 2002, the dutch Ministry of Economic Affairs is responsible for this.

<sup>4</sup>*Op cit.* art. 4, sect. 3.

<sup>5</sup>*Cf. Regeling vergoedingen OPTA 2003*, p. 18.

<sup>6</sup>*Cf. Van Damme (2002)*.

or just slack—and will do so particularly when they are in a principal-agent setting and their position resembles one of a monopoly. Given the nature of OPTA, these conditions seem to apply. Information asymmetries are likely to exist between the agency and the ministry, which provides the budget and OPTA is the sole controller of the telecom market. Although the quantitative impact of this should not be overstated, qualitatively the Niskanen effect has survived more recent scrutiny and today is widely acknowledged.<sup>7</sup>

Without the intent to make such an extreme acquisition, we here forward the argument that a serious conflict in OPTA's objectives, installed in the *Telecommunicatiewet*—albeit not hindered by OPTA's natural drive to survive as an institution—is likely to prevent it from ever becoming redundant. This central conflict is between OPTA's objective to keep the tariffs KPN Telecom charges to the independent suppliers close to the average costs of their use of the network, and its stated goal to invite entry and balance competition. These two ends bite, and as a result cannot be expected to both be met in the long-run. The telecommunication market will remain in unbalanced competition, with KPN Telecom as the dominant firm, a small competitive fringe, and OPTA the unavoidable mitigator.

This rest of paper is organized as follows. The next section presents a simple model of the underlying fundamentals of the telecommunication market. It is shown that a stable Nash equilibrium exists, with features quite similar to the situation present in the Dutch fixed network telecommunication market. Moreover, OPTA's role in establishing equilibrium is crucial as it controls both the revenues of KPN Telecom and the costs of the fringe, via the interconnection tariff. An example illustrates these short- and long-run effects. Section 3 subsequently discusses OPTA's role in mitigating the market. It is argued that OPTA may be vulnerable to the Niskanen effect, and will therefore stabilize that Nash equilibrium amongst all the ones it possibly could establish, in which its role is maximized. The final section offers some concluding remarks, including a possible way out of the OPTA deadlock.

## 2 A Model of the Dutch Telecom Market

We analyze a simple model that captures an essential part of the Dutch telecom market on the fixed network. One competitor, KPN Telecom, controls all

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<sup>7</sup>*Cf.* Moe (1997).

the infrastructure that is needed to provide fixed network telecommunication services as units of a homogeneous product. By law, KPN Telecom is forced to supply those units of services to whoever wants to resell it under its own brand name. For that supply, the dominant firm can charge a fixed and a variable interconnection charge. Both these prices have to be approved of by the regulator, that is, by OPTA. In order to simplify the analysis, we assume that the fixed charge that KPN Telecom demands from its resellers is always exactly in proportion to their amount of sales.

The costs of the regulator are shared among the firms supplying in that market. In accordance with the Dutch regulation, a dominant firm, that is KPN Telecom, pays 80% of the costs. The other firms taken as a group pay the remainder. More formally, in the stylized model of the Dutch telecom market, the profit functions of KPN Telecom and the fringe firms, therefore, are as follows:

$$\Pi_{\text{KPN}} = pQ + tq - [c(Q + q) + FC_{\text{KPN}} + 0.8FC_{\text{OPTA}} - R_{\text{KPN}}], \quad (1)$$

and

$$\Pi_{\text{fringe}} = pq - (tq + 0.2FC_{\text{OPTA}} + R_{\text{KPN}}), \quad (2)$$

respectively, where, for reasons of exposition, the fringe firms are lumped together in a single representative firm labelled ‘fringe’. Capital  $\Pi_i$  denotes profits of firm  $i$ ,  $p$  is the market price for a unit of telecom services,  $Q$  is KPN Telecom’s sales of units,  $t$  is the interconnection tariff charged by KPN Telecom for variable capacity to the fringe firms,  $q$  is fringe sales,  $c$  reflects constant marginal costs,  $FC_{\text{KPN}}$  are the fixed costs of production of KPN Telecom,  $FC_{\text{OPTA}}$  are the (fixed) costs made by OPTA in policing the market, and  $R_{\text{KPN}}$  is the fixed interconnection charge of KPN Telecom.<sup>8</sup>

Note that all is variable except the split of the costs made by OPTA—20/80% is laid down in law. Also note that effectively, KPN Telecom determines, albeit with OPTA watching, the input prices of the newly established suppliers of telecommunication services. This is interesting, since the fringe consists of KPN Telecom’s (potential) competitors on the services market. In the following, we first analyze the long run equilibrium in this simple model of the market.

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<sup>8</sup>This representation of profits captures the main elements of the parties’ costs. See, for instance, <http://www.kpn-wholesale.com/> for similar pricing structures for some of the products KPN Telecom supplies to resellers.

Before turning to that analysis, let us provide some insight into the money involved in the Dutch fixed network telecommunication. At the time of writing this paper, a representative (*i.e.*, national) interconnection tariff  $t$  was set at ranging from EURO 0.0047 to 0.013 and the fixed interconnection charge  $R_{\text{KPN}}$  was EURO 85,992.<sup>9</sup> The fixed costs KPN Telecom reported in 2001 ( $FC_{\text{KPN}}$ ) are EURO 3,847,000,000.<sup>10</sup> OPTA's costs ( $FC_{\text{OPTA}}$ ) were about 0.1% of this, with a 2001 report of approximately EURO 3,350,000.<sup>11</sup> Total sales volumes are hard to come by, but the market share of KPN Telecom in the years 1999, 2000 and 2001 was 78, 66 and 60% respectively, leaving the fringe a slightly growing, but structurally small share of the market.<sup>12</sup> The marginal costs of KPN Telecom,  $c$ , are also hard to obtain. Yet, it seems not unreasonable to assume they approach zero—as we do. Finally, the telecom market being known for its use of confusing non-linear pricing strategies, it is difficult to present simple prices, but the price of a call of one minute within a region KPN Telecom charged at the time of writing via the fixed connection is EURO 0.0425 in the peak hours and EURO 0.0201 otherwise, upon a start tariff per call of EURO 0.05, and a monthly fee of EURO 17.18.<sup>13</sup>

## 2.1 The Long Run

Given the homogeneous nature of the commodity sold, price competition and free entry will yield a long-run equilibrium in this market that is characterized by zero economic profits for all firms. This zero-profit condition,  $\Pi_{\text{KPN}} = \Pi_{\text{fringe}} = 0$ , returns the following:

$$p(Q + q) - c(Q + q) - FC_{\text{KPN}} - FC_{\text{OPTA}} = 0. \quad (3)$$

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<sup>9</sup>For the latter figure, that is the fixed charge plus the charge per access point times the number of access points in the whole country. All figures in the remainder of this paragraph are exclusive of VAT, unless stated otherwise. See <http://www.kpn-wholesale.com/> for more examples.

<sup>10</sup>See the annual report of KPN Telecom for 2001 (KPN Telecom, 2002). These are the fixed costs (excluding depreciation and changes in worth) in 2001.

<sup>11</sup>This figure is reported in *Regeling vergoedingen OPTA 2001* for a firm offering fixed network connection and enjoying considerable market power. The actual costs of OPTA are about three times higher, as it supervises other markets, like the mobile network market, as well—see OPTA (2001). Likewise, KPN Telecom's fixed costs are somewhat overstated here, as other services are offered via the fixed infrastructure such as the provision of internet access, but are not included here.

<sup>12</sup>Market share is defined here as the number of minutes KPN Telecom has provided, relative to the total market it serves via the infrastructure. *Cf.* KPN Telecom (2002).

<sup>13</sup>These prices hold for the *belbasis* subscription, which is arguably the most popular one, and for nation-wide calls. See <http://www.kpn.com/> for prices and additional tariffs. The numbers reported here are VAT-inclusive.

Now, let  $\alpha$  be the market share of the fringe firms—so that  $1 - \alpha$  is the market share of KPN Telecom. Then we have

$$\begin{aligned}\Pi_{\text{KPN}} = 0 = & \quad p(1 - \alpha)D(p) + \alpha t D(p) - cD(p) \\ & - (1 - \alpha)(FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}),\end{aligned}$$

which can be rewritten to:

$$((1 - \alpha)p + \alpha t - c)D(p) = (1 - \alpha)(FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}),$$

which in turn solves as

$$t = \left( p - \frac{FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}}{D(p)} \right) \left( 1 - \frac{1}{\alpha} \right) + \frac{c}{\alpha}. \quad (4)$$

This critical value of the interconnection fee  $t$  is the variable tariff OPTA can set to ensure that profits are indeed equal to zero and market shares remain stable.<sup>14</sup> Thus, besides depending on the market share of the fringe firms,  $\alpha$ ,  $t$  is a function of general market conditions  $p$  and  $D(p)$ , and of all cost components,  $FC_{\text{KPN}}$ ,  $FC_{\text{fringe}}$ , and  $c$ .

The expression for the long-run interconnection tariff has at least two characteristics that are worth noting. First, since the second term in brackets is negative for  $\alpha \leq 1$ ,  $t < c$ , which means that KPN Telecom is losing money on every unit it sells to one of its competitors. This is not inconsistent with the rough data presented above. Second,  $\frac{dt}{d\alpha} > 0$ , which indicates that as the market share of the fringe firms (KPN Telecom) increases, the profit margin decreases (increases). As a result, any equilibrium in the market can be sustained by OPTA, by changing  $t$ .

To illustrate the latter point, consider the effects of an increase in market share by a party on either side of the market. If KPN Telecom increases its market share at the expense of the new entrants, it increases its profits, as it substitutes away from losing money on selling to competitors (since  $t < c$ ). OPTA, however, effectively responds to this by decreasing  $t$ ,  $\alpha$  has to decrease when  $1 - \alpha$  increases, and  $\frac{dt}{d\alpha} > 0$ . This increases demand by the other firms, as their profit margins increase. Therefore, any attempt by KPN Telecom to grow will meet strong resistance by the other firms. Something similar occurs if the fringe firms attempt to increase their market shares—it does increase

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<sup>14</sup>Note that in this it is assumed that KPN Telecom charges a share  $\alpha$  of all of its fixed costs to the fringe firms. These fixed costs include the ‘fee’ it has to pay OPTA. This assumption does not affect the qualitative findings, however.



their profits, but since OPTA responds by increasing  $t$ , KPN Telecom would be reluctant to give up market share and increase sales via the fringe, which is a loss making activity. Hence, increasing market share is virtually impossible for the fringe.

A more formal analysis verifies these effects. Differentiating equations (1–2) with respect to  $\alpha$ , whilst taking into account the (optimal) response by OPTA, equation (4) yields zero's. In other words, in the long run, and in the presence of OPTA, whose policy is characterized by equation (4), all attempts by any of the suppliers to increase profits by increasing market share are futile.

## 2.2 The Short Run

From the preceding analysis it follows that, if OPTA responds optimally (that is according to equation (4)), the market is more or less static in the long run. The informational requirements on OPTA to react in this way, however, are rather strict. It is not unreasonable to foresee that, in the short run, an external shock is not accommodated in full, or is not responded to immediately. After all, to do so requires quite some insight into the characteristics and development of the market that even OPTA cannot be expected to obtain instantaneously. If we allow for this, deviations from the long run equilibrium are possible.

In the short run, that is for a given, not necessarily optimal,  $\bar{t}$ , the intentions of both KPN Telecom and the fringe can be studied by differentiating their profits at the status quo. This returns the following.<sup>15</sup>

$$\frac{d\Pi_{\text{KPN}}}{d\alpha} = -(p - \bar{t})D(p) + FC_{\text{KPN}} + 0.8FC_{\text{OPTA}} < 0, \text{ and} \quad (5)$$

$$\frac{d\Pi_{\text{fringe}}}{d\alpha} = (p - \bar{t})D(p) - FC_{\text{KPN}} - 0.8FC_{\text{OPTA}} > 0, \quad (6)$$

so that both firms have an incentive to increase their market share, as that increases their profits.

To illustrate the short run developments in the market on which this result may shed some light, let us go back to the situation at the time OPTA was established, with KPN Telecom being the sole supplier, and no competitive fringe present. OPTA at the time sought to set  $t$  in such a way that it enabled new firms to enter the market. There is reason to believe OPTA set  $t$  very low at time, acting aggressively towards accommodating entry. As a result, the

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<sup>15</sup>The inequalities hold if  $(p - t)D(p) > FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}^*$ , which is the case as  $c > t$ , and profits are nonnegative.

profit margins of the entering firms were relatively high and those firms very much would have wanted to enter and increase their sales rapidly. After all, upon entry they have paid for part the fixed OPTA costs involved, and the marginal costs plus the part in the fixed network costs together are below the market price.

However, KPN Telecom cannot allow the fringe to expand, as that would impose a loss to the company, since anything it sells to the fringe, it effectively sells below market price—even if KPN Telecom would increase production—since  $t \ll c < p$ . Therefore, KPN Telecom can credibly claim that it cannot offer more capacity to the fringe. Therefore, an equilibrium is established at a value of  $\alpha$  that solves equation (4) for that specific interconnection tariff  $t$ . That is, with little entry, a small market share for the fringe, and maintained dominance of KPN Telecom, as  $\frac{d\alpha}{dt} > 0$ . If, on the other hand, it were the case that OPTA has set  $t$  too high, the profit margin of the fringe would have been low to nil, and entering firms would either not have resold anything, or they would have had to sell a very high quantity at once, for being active in the market to be profitable. As KPN Telecom would have been very hesitant to supply services—let alone services of sufficient quantity, another dimension along which KPN Telecom displayed resistance to the fringe entry, here ignored as we consider a homogenous commodity—again only KPN Telecom would have served the market. In any event, therefore, OPTA’s objective to invite entry into the telecommunications market are difficult for the regulator to meet.

### 2.3 An Illustrative Example

To illustrate the various short- and long-run effects identified above, consider the following simple numerical example of the forces at work. We do not claim any particular relevance for the numbers used below. The sole intent is to provide some insights into how OPTA can steer equilibria in the market via  $t$ , and what effects can be expected from deviations from the equilibrium levels.

Assume that there is a linear demand function  $D(p) = a - bp$  for a homogeneous good, and that marginal cost,  $c = 1$ ,  $a = 500,000$ ,  $b = 1$ ,  $FC_{\text{KPN}} = 1.000,000$ , and  $FC_{\text{OPTA}} = 50,000$ . This generates  $p \simeq 3.10$ , and  $D(p) \simeq 499,997$ . Table 1 lists the various combinations of  $t$  and  $\alpha$  that satisfy the equilibrium conditions ( $\Pi_i = 0$ ) for these numbers.

It can be observed that a higher  $t$ —counterintuitively, as  $t$  is their input price—leads to a higher market share of the fringe firms. This occurs because

t!]

Table 1:  $\alpha$  and  $t$  in an illustrative example

$t$	$\alpha$
0.820	0.10
0.920	0.20
0.953	0.30
0.970	0.40
0.980	0.50
0.987	0.60
0.991	0.70
0.993	0.75

the lower profit margin,  $p - t$ , forces the fringe firms to sell more in order to maintain maximum (zero) profits. This effect is illustrated in Figure 1.

The two market shares for KPN and the fringe, respectively, are determined by the intersection of the two net average costs curves, and the market price, which is determined by the costs of KPN and the fringe together, so that profits are zero. A higher  $t$  shifts the net average cost curve of the fringe firms,  $AC_{\text{fringe}}(t)$ , upwards. As the loss margin of KPN Telecom decreases ( $t < c$ ), the average cost curve of KPN Telecom,  $AC_{\text{KPN}}(t)$ , will shift down in proportion

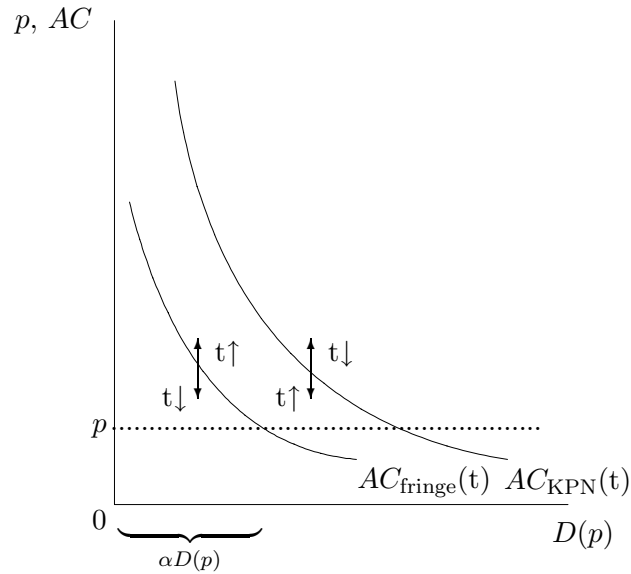


Figure 1: A Prototypical Telecommunication Market

to this, as the market equilibrium price  $p$  is independent of  $t$ . Consequently, by pinning down  $t$ , OPTA chooses the distribution of the market.

### 3 OPTA's Deadlock

Next, consider OPTA's mitigation task. As said, the explicit task of OPTA is to steer the fixed network telecom market to one in which KPN Telecom's historic monopoly is broken and replaced by balanced competition. This OPTA can achieve by setting  $t$  so as to support a symmetric oligopolistic market. Effectively, that means forcing KPN Telecom to sell network access to other firms, which the latter is hesitant to do, certainly in the short-run, with fixed interconnection tariffs, but probably even in the long-run, when its profits are being compensated via adjustment of  $t$ .

So in its efforts to comply with its stated objectives, OPTA faces at least one reluctant party. To that should be added that, as explained in the introduction, OPTA is a bureaucracy open to the Niskanen effect. Its future funding depends on two main factors: its present costs, which is the larger and fixed part, and the variable income it receives from the mitigating tasks it fulfils. Not only is it therefore in the interest of OPTA to maintain a market structure in which some party at least does not decrease in market size below the 25% threshold set for "considerable market power," so that it falls under the high tariff structure. It is crucial for OPTA's proliferation that KPN Telecom maintains a sufficiently asymmetric market share. That is, since it is explicit that OPTA's role as mitigator of the market would be trimmed substantially once the competitive balance displays a reasonable number of suppliers with more or less equal market shares, it has an interest in preventing this from happening. By maintaining the high market share of KPN Telecom, OPTA can keep its high budget. Moreover, in that way OPTA can substantiate that it may require higher budgets to perform its tasks properly. After all, it has to continue fighting the KPN Telecom monopoly.

The setup of the regulatory arrangements does not help OPTA to resist the perverse pressures it faces, to say the least. Consider the following: when the interconnection tariff  $t$  is not in equilibrium, and since it is smaller than  $c$ , KPN Telecom refuses to give away market share in the short run. The fringe firms, however, want to increase their market share, either because  $t$  is below its equilibrium value given in equation (4) above and the fringe can increase

profits by obtaining a larger market share, or because  $t$  is above its equilibrium value, and then the fringe needs a higher market share in order to maintain zero profits given the fixed costs it faces. This reluctance of KPN Telecom is typically what is observed in the newspapers.<sup>16</sup> Officially, OPTA would need to mitigate in this, and force KPN Telecom to part from its market share. Yet, it runs counter its silent objective to maintain an asymmetric market structure. Therefore, OPTA would be tempted in the long run to adjust the interconnection tariff so as to accommodate for KPN Telecom's problems with increasing its loss-generating sales via the fringe. By thus moving  $t$  in the direction of its equilibrium value, the fringe firms loose their interest in a larger share of total sales, and OPTA effectively stabilizes the status quo.

A second detrimental effect of OPTA's deadlock position is that it is also not encouraged to keep its costs in check. That is, it can enlarge its bureaucratic costs in  $FC_{\text{OPTA}}$ , as it can restore market equilibrium by changing its instrumental variable, the interconnection tariff.<sup>17</sup> From equation (4) it follows directly that an increase in the costs of OPTA are in equilibrium matched by an increase in  $t$ . In the short run, with  $t$  fixed, however, the effects of increased OPTA costs are comparable to the pressures on OPTA from disequilibrium interconnection tariffs discussed above. That is, since total differentiation of the zero profit conditions of both KPN Telecom and the fringe gives the following signs for the effect of  $TC_{\text{OPTA}}$  on the desired market share:

$$\begin{aligned} \left. \frac{d\alpha}{dTC_{\text{OPTA}}} \right|_{\Pi_{\text{KPN}}=0} &= - \frac{\partial \Pi_{\text{KPN}} / \partial TC_{\text{OPTA}}}{\partial \Pi_{\text{KPN}} / \partial \alpha} \\ &= \frac{0.8(1 - \alpha)}{(t - p)D(p) + TC_{\text{KPN}} + 0.8TC_{\text{OPTA}}} < 0, \end{aligned} \quad (7)$$

and

$$\begin{aligned} \left. \frac{d\alpha}{dTC_{\text{OPTA}}} \right|_{\Pi_{\text{fringe}}=0} &= - \frac{\partial \Pi_{\text{fringe}} / \partial TC_{\text{OPTA}}}{\partial \Pi_{\text{fringe}} / \partial \alpha} \\ &= \frac{0.8\alpha + 0.2}{(p - t)D(p) - TC_{\text{KPN}} - 0.8TC_{\text{OPTA}}} > 0. \end{aligned} \quad (8)$$

These expressions indicate that both KPN Telecom and the fringe firms want to increase their market share, giving rise to a conflict in which KPN Telecom's having to OK sales via the fringe leads to the blocking problem discussed above. Although this runs counter to the general objective to lower the interconnection

<sup>16</sup> Cf. Het Parool, 2003, for a recent example.

<sup>17</sup> Note, for example, that there has been a 23% costs increase from 2000 to 2001 – *Regeling vergoedingen OPTA 2001*.

tariff in order to accommodate entry into telecommunication market, the way in which OPTA tasks have been handed down to the institution put it in a difficult position to carry them out as intended.

The sketch of the market provided in Figure 1 above illustrates the effect of an increase in the costs of OPTA. From equation (3), it is clear that when  $FC_{\text{OPTA}}$  increases, market demand decreases and the market price increases, albeit only slightly in the example here. That is, the dotted price line in Figure 1 shifts upwards. The effect of this on the respective market shares is ambiguous, as a closer inspection of equation (4) reveals. An increase in  $FC_{\text{OPTA}}$  increases  $t$ , but at the same time  $p$  increases, which in turn decreases  $t$ . Again, OPTA can install any distribution of the market it sees fit.

## 4 Concluding Remarks

We have identified two channels through which OPTA may be tempted to deviate from its set goal to open the fixed telecommunications network up for new entrants into the market, both leading to its accommodation of KPN Telecom's reluctance to sell part of demand via the fringe firms while allowing OPTA to give in to a Niskanen effect. If indeed these processes are at work in the Dutch telecommunications market—and there is some anecdotal evidence at least that they might very well be—a question of interest is how to set up natural monopoly control without these detriments.

A first—and to the situation of OPTA quite specific—feature that stands out in the setup chosen to regulate the Dutch telecommunication market on the fixed network is the way in which OPTA is financed. As it draws the larger part of its budget directly from the parties it is to control, in which in turn the telecom firms with the larger (dominant) market share pay a disproportionately large fee in the two-part tariff structure, there is a direct tie between OPTA's regulatory efforts and its income. We have pointed out how particularly this potentially interferes with OPTA's objective to establish symmetric competition on the net. Should OPTA be financed out of general funds, it would be able to carry out its tasks with a greater degree of independence from the industry.

A more fundamental change to the setup that is likely to enhance the enforcement of average cost pricing by a regulator, which does not fall victim to the perverse incentive effects that OPTA faces, would be a strict separation of ownership of the infrastructure from the use of it. This setup has, for example,

been chosen for the railway tracks in the United Kingdom as well as in The Netherlands—where the infrastructure is either a government subsidiary or a regulated private monopoly. The company responsible for the infrastructure then is effectively given control over the natural monopoly, so that it should be controlled strictly. But when the use of the infrastructure is in separate hands, there theoretically no longer is a preferred user—like KPN Telecom is to itself at the moment. The infrastructure firm, in fact, would have a preference for competition for its services, thus inviting entry into the market for use of the infrastructure.

This separation of ownership and use, however, also has an important downside. With ownership and use integrated, there is a clear incentive for the owners of the infrastructure to invest in the maintenance of the network. Additionally, it has superior information on how to do so efficiently. A stand-alone infrastructure owner, on the contrary, lacks the incentive to choose an efficient level of maintenance. Therefore, the government control of the infrastructure firm is essential, yet likely to be off the mark as well—see Wagner (1991). There are several ways in which these information and incentive problems of a pure mitigator, with no ties to the industry, can be accommodated for. One could, for example, opt to elect and re-elect a regulator on a regular basis—see Besley and Coate (2000). That way, it is forced to regularly give account of its activities, which the public can check against its private information. Another option is to establish yardstick competition of the kind advocated by Shleifer (1985), in which different regulators are compared, for example, internationally. Another an option would be to preset goals for the completion of which various institutions subsequently compete. All of these ways of organizing regulation of the market would enhance the dissemination of information and stimulate OPTA to regulate towards efficient use of the fixed telecommunication network.

We have shown how in its present setting OPTA will live long. Since a natural monopoly requires some sort of regulatory control, this in itself is not necessarily a problem. The problem in the present regulatory construction, however, is that with a long lived OPTA, an asymmetrically competing market, in which OPTA is open to the Niskanen effect, remains. A clean break between infrastructure, use of the infrastructure, and control on the price setting by the infrastructure operator would enable an unobstructed view of the processes at play. Moreover, it would accommodate a structural shift to symmetric competition on telecommunication services. Such an organization of the natural

monopoly would also call for a role for OPTA. Rather than the current uneasy position, as a temporary addition to the *Nederlandse Mededingingsautoriteit*, however, OPTA would then be an integral part of NMa, guarding the isolated problem of the pricing of network services at average costs. Long live OPTA, that is, but meaner and leaner than it is today.

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